科技部補助專題研究計畫成果報告
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不同性別護理師之職涯發展軌跡與留任意願研究：整體性、縱貫性的觀點

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中 文 摘 要 ： 護理師的高流動率是全球重要議題，因為會影響醫療保健服務成本
與護理品質。平均而言，男性護理師的離職率是女性兩倍，且常在
開始進入護理專業職場的四年內即離職。主要的原因多與職業的性
別刻板印象有關，即使是已開發國家。性別的偏差不但阻礙了男性
學生的招收，亦影響其留在職場。護理教育者應及早認知男性對護
理專業的貢獻，尤其有愈來愈多的男性加入了護理專業。然而目前
有關兩性之職涯發展與檢視其間異同之研究闕如。在過去有限的少
數研究中，多是採質性研究，或量性研究是採橫斷式研究設計，或
針對小樣本進行的研究。因此，此議題應得到高度的關注。但如欲
以追蹤式研究設計進行兩性職涯發展與軌跡研究前，必須先有良好
的測量工具。本研究是一系列計畫的第一部份(研究主題為「護理職
涯發展相關量表的發展與測試」；主要目的即是在發展及檢測能用
於測量與調查兩性護理師職涯發展的測量工具。本研究共完成四份
測量工具：兩份翻譯量表（「工作—家庭衝突量表」與「職業發展
滿意度量表」）與兩份自擬量表（「職業發展的助力及阻力因素問
卷」與「護理能力量表」）。結果顯示兩份翻譯量表均具有良好的
內容效度、內在一致性，以及中等程度的穩定性（再測信度檢定
）。而兩份自擬量表（「職業發展的助力及阻力因素問卷」（共15題
)與「護理能力量表」（共60題））則除了亦具有良好的內容效度與內
在一致性，以及中等程度的穩定性（再測信度檢定）外，並具有良
好區辨效度與建構效度（兩份量表之因素分析所得之整體變異量的
解釋力分別為 72.4% 及78.9%）。綜合本研究之所得，本研究所發
展之四份測量工具均可提供後續研究使用，以期能檢視並比較不同
性別護理師之職涯發展軌跡與留任意願研究。

中 文 關 鍵 詞 ： 護理師、性別比較、職家衝突、職涯發展、職涯滿意度、護理能力
、量表發展與檢測

英 文 摘 要 ： Today, high nursing turnover rate is a serious problem in
the world because which represents a major problem for
health care service in terms of cost and quality of care
given. On average, male nurses' turnover rate is twice
that of female nurses, and generally speaking, they change
professions within 4 years of starting their nursing
careers. One of main reason is gender role stereotypes
regarding occupations remain even in developed nations.
Gender bias in nursing education impedes recruitment and
retention of males into the profession. Nurse educators
should be aware of men's contributions to nursing
profession, particularly, more and more males participate
in the profession. However, there is lacking studies to
exploring career development and examine the similarity and
differences for two gender nurses. In a few studies, most
of them conducted a qualitative research design or
quantitative research design but with a cross-sectional
research design as well as with a limited sample size. This
issue should be get high attention. There is a room to
develop more valid instruments to examine two gender

nurses' career development and trajectory using a longitudinal research design. Therefore, in our study, the first part ("Scale development and validation: nursing career development") of a series study, the main purposes were to develop valid instruments to measure and investigate the career development for two gender nurses first, then to examine the similarity and difference between male and female nurses. A total of four scales including two translated scales and two self-development scales were tested and validated in this study. For two translated scales: "Work-Home conflict scale" and "The Career Satisfaction Scale" (CSS) all showed good content validity, internal consistency, and a moderate stability. For two self-developed instruments, "The Scale of Support and Barriers in Work (SSBW)" and "the Scale of Nursing Competence (SNC)", not only showed good content validity, internal consistency, and a moderate stability but also good discriminant validity and construct validity. The results of the EFA provided support for a three-factor structure for the SSBW (a 15-item scale) accounted for explain 72.4% of the total variance; a nine-factor structure for the SNC (a 60-item scale) accounted for 78.9% of the total variance. In summary, based on our findings, the four instruments will be appropriately used in future study to examine and to compare the career development and trajectory, as well as the changes of intention to stay for both genders

Introduction

Today, high nursing turnover rate is a serious problem in the world because which represents a major problem for health care service in terms of cost and quality of care given. On average, male nurses' turnover rate is twice that of female nurses, and generally speaking, they change professions within 4 years of starting their nursing careers (Duffin, 2006; Evans, 2002). One of main reason is gender role stereotypes regarding occupations remain even in developed nations. It is assumed that females should have a "woman's job" and males should have a "man's job" (Sherrod, Sherrod, & Rasch, 2005). Gender bias in nursing education impedes recruitment and retention of males into the profession. Nurse educators who are unaware of men's historical contributions to the profession may unknowingly perpetuate gender bias (Anthony, 2004).

For decades the nursing community all over the world has been focusing to better improve the intention to stay for nurses and to minimize certain stereotype against gender differences in nursing career. However, how to change traditional stereotypes is still to be challenged; teaching/ learning strategies also can be customized to gender-driven learning styles. Particularly, men are now more and more entering the nursing profession in record numbers, challenging the notion that men are inappropriate in caregiver roles or incapable of providing compassionate and sensitive care (Evans, 2002). Actually, there is lacking studies to examine career development and the intention to stay simultaneously. In a few studies, most of them conducted a qualitative research design or quantitative research design but with a cross-sectional research design as well as with a limited sample size. Besides, there is a room to develop more valid instruments to examine two gender nurses' career development. Therefore, in our study, we would like to develop valid instruments to measure and investigate the career development for two gender nurses first, then to examine the similarity and difference between male and female nurses.

Career development and the intention to stay for two gender nurses

For the only few longitudinal research, Abrahamsens (2004) conducted a retrospective longitudinal research (from 1977 to 1998) data among 1450 nurses based on a Norwegian Survey of Nurses. In Abrahamsnes's (2004) study, the main purposes of were to examine nurses' mobility process, differences and similarities in positions and fields of activity, working hours and income and also to identify constructions of masculinities of male nurses. Abrahamsens found that most (more than 70%) male nurses went into somatic wards after completed training, only a very few went into psychiatry. Large changes occurred during the career. Most noticeable is the fact that male nurses rapidly leave somatic wards and go into other fields psychiatry is one of these fields. However for female nurses, almost all of them (90%) chose the somatic ward for their first job; the rate was a notably higher than that of men. Even though it is just as normal for men and woman go to work in in the somatic wards,

it does not mean that they undertake the same jobs. Because Abrahamsens found that male nurses went into administration and leadership while the women undertake tasks more closely related to the patients. Abrahamsens also looked at the relationships between time factor and administration work, they found there is little difference between men and women during the first year. However till four to five years later, more than half of the male nurses have acquired positions of leadership. Conversely, only 20% of the women are in similar positions. As to Working hours and income, their study showed that most of the female nurses (almost 90%) start their career working full time but the hours reduced along the work years. For example, five years later, 50% of female nurses work reduced hours becoming part time. Conversely, for male nurses, very few male nurses work part time (about 5%). For the mean income, male nurses' salary were significant higher than female, however the reasons is related to work type (full time or part time work). For male nurses, while they enter the nursing field, they tend to face conflict from their own and others' views on masculinity. Newly qualified male nurses tend to experience expectations of traditional masculinity. After a short time in the nursing profession, questions will be raised concerning their choice of occupation and further career development (Abrahamsene, 2004). The pattern of career changes for nurses has been recognized in several countries including Taiwan. For example, Lai, Lin, Chang, Wang, Liu, Lee, & Chang (2008) employed a cross-sectional research design with 130 nurses recruited from ICUs to understand their intention to leave their job.

Additionally, for male nurses study, it is widely known that male nurses are working within limited units such as psychiatry, administration, acute medicine (emergent room), OR, etc. (Abrahamsene, 2004). Yang, Gau, Shiau, Hu, & Shih (2004) investigated professional career development for male nurses in Taiwan including male nurses' motivations for becoming a nurse; their professional developmental process in nursing; the difficulties hindering their professional development from both professional and gender aspects; and the strategies who used to cope with these difficulties. In our study, the question "whether or what differences in choosing work units, leadership, work type and income between men and women? will be expected to answered. We will adopt a prospective longitudinal research design to observe the change of career development trajectory and the rate of intention of stay.

Purpose

This study includes two parts:

Part 1:

The title of the first part was "Scale development and validation: nursing career development", i.e. this study has been completed (from August 1st, 2017 to July 31st, 2018).

Part 2:

The title of the second part is "Nurses' career development trajectory & intention to stay between female and male nurses: a three-year longitudinal study" which is conducting in this year and will be conduct in future.

In summary, the main purposes of this study (i.e. the first part) were to develop and validate the scales that will be used in the second part.

Method
Research design and participants

We developed and validated the scales using a two-stage test. At Stage 1, the scales were developed by reviewing literatures, jury opinions, and based on researchers' previous experiences. Then, content validity and item reductions were conducted. At Stage 2, we examined the final scales for construct validity, internal consistency, and test-retest reliability. For psychometric testing, a cross-sectional survey was carried out in this study. Participants were free to stop participating at any time; participation was anonymous, confidential, and voluntary. A purposive sampling method was used to recruit RNs in the three medical centers in Taipei. Finally, 112 nurses participated in this study.

Instruments

Two questionnaires (the scale of "Work-Home conflict" and " The Career Satisfaction Scale (CSS) ") were translated into Chinese and two scales ("The Scale of Support and Barrier in Work " and " The scale of nursing competence") were developed and validated in this study.

Translated scales

The scale of Work-Home conflict and The Career satisfaction Scale were translated from English into Chinese using forward-translation.

Work-Home conflict

Ntemeyer, Boles & McMurrian (1996) developed a scale to measure WFC (work-family conflict) and FWC (family-work conflict). The scale is a 10-item scale including work-home conflict (5 items) and home-work conflict (5 items) with a 5-point Likert scale ranging from strongly disagree (1) to strongly agree (5). The range of the total score was 10-50 points, with

a higher total score indicating that a nurse perceived a higher conflict between work and home.

The Career Satisfaction Scale (CSS)

The CSS was developed by Greenhaus, Parasuraman, and Wormley (1990). We translated it from English into Chinese using forward-translation. It is a 5-item scale with a 5-point Likert scale ranging from strongly disagree (1) to strongly agree (5), total score from 5-25. A higher score indicated a higher career satisfaction for a nurse.

Validity and reliability

Content validity

Five experts in the fields of nursing administration and nursing education were invited to validate the questionnaire. Each of the experts was asked independently to rate the relevance/importance of each item, using a 4-point Likert-type scale, with responses ranging from 1 = not relevant/ unimportant to 4 = relevant/important. The content validity index (CVI) scores were used to determine the validity of the content of each item and the average for the scales. Polit & Beck (2017) suggested the item CVI (I-CVI) over 0.80 and the scale CVIs (S-CVIs) over 0.90 were taken as demonstration excellent content validity.

Reliability: internal consistency and test-retest reliability

We examined internal consistency and stability. Cronbach's a was used to examine the internal consistency of the scales. A Cronbach's a value of .70 indicated an acceptable internal consistency reliability, while a value of .80 or higher indicated a good internal consistency reliability (Nunnally & Bernstein, 2010; Rattray & Jones, 2007). With regard to stability, test–retest reliability was assessed over a 2-week period on the basis of a subsample of 109 nurses. An intraclass correlation coefficient (ICC) score was used to calculate the test–retest reliability.

Self-developed scales

Two self-developed scales were developed and validated in this study: "the Scale of Support and Barrier in Work" and "The Scale of Nursing Competence".

The Scale of Support and Barrier in Work (SSBW)

It is a 15-item scale with a 5-point Likert scale ranging from strongly disagree (1) to strongly agree (5), total score ranging from 15-75. A higher score indicates a higher support perceived by a nurse in work.

The Scale of Nursing Competence (SNC)

Originally, a 66-item scale was developed. The scale included six domains: clinical care (12 items), legal/ethical practice (12 items), communication and coordination/collaboration (10 items), leadership and management (12 items), teaching/coaching (10 items), and professional development (10 items). The definition of each domain was as follow (WHO,

2010; Clinton, Murrells, & Robinson, 2005; Jasper, 2011; ANA, 2015 ; Burket et al., 2010 ; Liu, Yin, Ma, Lo, & Zeng, 2009; Wilson, 2012; EFN, 2015; IECEP, 2011; Liu & Aungsuroch, 2018; Sastre-Fullana et al., 2017):

Clinical Care:

It was defined as "nurses could provide appropriate and necessary clinical care for patients, including critical and dying clients; all practices should be based on evidence and critical thinking.

Legal/ethical:

It was defined as nurses should be able to practice according code of ethical and legal regulation in the nursing practices.

Communication and coordination/collaboration:

It was defined as nurses should be able to effectively communicate with colleagues and inter-professional staff, administrative department staff and therapeutically with individuals, families, and groups.

Leadership and management:

It was defined as "nurses should be able to lead a group, effectively manage time, delegate tasks to others, make decisions and improve the quality of healthcare in the professional practice"

Teaching and Coaching:

It was defined as "nurses should be able to perform assessment of clients' readiness to learn, apply teaching strategies, and evaluate teaching effectiveness to promote health for patients and families".

Professional development:

It was defined as "nurses should be able to use of appropriate search methods including electronic database, online/non- online resources to learn, integrate and update evidence and research findings. Also nurses could complete continuing educational requirement and

Validation of self-developed instruments: psychometric tests
Content validity

A total of five experts were invited to validate the questionnaire, four were in the fields of nursing administration (one vice president with nursing background and three directors of nursing department) and one professor of the field of medical management. Each of the experts was asked independently to rate the relevance/importance of each item, using a 4-point Likert-type scale, with responses ranging from 1 = not relevant/ unimportant to 4 = relevant/important. The content validity index (CVI) scores were used to determine the validity of the content of each item and the average for the scales. Polit & Beck (2017) suggested the item CVI (I-CVI) over 0.80 and the scale CVIs (S-CVIs) over 0.90 were taken

as demonstration excellent content validity. The questionnaires were also revised according to experts' opinion.

Item analysis

Including means, standard deviations (SDs), extreme group comparison, and homogeneity test were used to assess the suitability of the items. For the extreme group comparison, two groups were formed, that is, the participants scoring in the top 27% and those scoring in the bottom 27%. An independent t-test was used to examine the difference between the two groups regarding the average scores for each item and total score (i.e. discriminant validity). For the homogeneity test, item-total correlation was used to examine the correlation between each item and total score, which was deemed adequate when it exceeded 0.30 (Nunnally & Bernstein, 2010).

Construct validity

A total of 112 nurses from three medical centers were invited to fill in the questionnaire. An exploratory factor analysis (EFA) was used to examine the construct validity. The measures of sampling adequacy (MSAs) were determined by Bartlett's test of sphericity ($p < .05$) and Kaiser–Mayer–Olkin ($>.6$). The best-fit structure and the correct number of factors were determined using eigenvalues (>1.0), Cattell's scree test, a factor loading cutoff of 0.4, and the percentage of variance induced by each factor (Stevens, 2002).

Reliability: internal consistency and test-retest reliability

We also examined internal consistency and stability (test-retest reliability) of the two self-developed instruments. A Cronbach's α was used to examine the internal consistency of the scales. A Cronbach's a value of .70 indicated an acceptable internal consistency reliability, while a value of .80 or higher indicated a good internal consistency reliability (Nunnally & Bernstein, 2010; Rattray & Jones, 2007). With regard to stability, test–retest reliability was assessed over a 2-week period on the basis of a subsample of 109 nurses. An intraclass correlation coefficient (ICC) score was used to calculate the test–retest reliability.

Data Analysis

We used SPSS (SPSS, Inc., Chicago, IL, USA) statistical software (version 21.0) for Statistical analysis. Data were analyzed using descriptive statistics, item analysis, Pearson's correlation, EFA, and reliability analysis.

Result and Discussion
Background of participants

Among 112 participants, 109 (97.3%) were females; 2 (1.8%) were males. Age ranged from 23 to 59 with an average age of 32.36 (SD 8.96). over a half of participants were single (56.3%). The majority of participants were resisted nurses (90.2%). Three-forth (75.0%) participants had a bachelor degree. Approximately two-third of the participants work in surgical or medical wards (39.3% and 24.1%, respectively); 17.0% worked in pediatric wards (Table 1).

Career development of participants

As to career development and trajectory, the length of total work experience ranged from 1.83 to 34.67 years with an average of 10.31 years (SD 8.74). The length of current working experience ranged from 0.3 to 34.67 years with an average of 8.49 years (SD 7.92). Among nursing ladder system, both N level (n=3, 2.7%) and N1 (n=38, 33.9%) occupied 36.6%; followed by N2 (n=30, 26.8%); both N3 (n=20) and N 4 (n=21) occupied 36.7% (Table 1). With regard to future career development, 8 participants (7.1%) plan to move towards nursing administrators (e.g. head nurse, supervisor, etc.); 10 participants (8.9%) will develop towards nurse practitioner (NP); 41 participants (36.6%) consider change their job (Table1).

Table 1　*Participants Background and career development (N=112)*

	n	%		n	%
Sex	**111**		**Job position**	**112**	
Female	109	97.3	Register nurse	101	90.2
Male	2	1.8	Nurse	6	5.4
			AHN & HN	5	4.5
Education degree	**111**		**Nursing ladder system level**	**112**	
Junior college	19	17.0	N or N1	41	36.6
Bachelor	84	75.0	N2	30	26.8
Master	8	7.1	N3	20	17.9
			N4	21	18.8
Marital status	**97**				
Unmarried	63	56.3	**Unit**	**108**	
Married	34	30.4	Surgical wards	44	39.3
			Medical wards	27	24.1
Age (years old)	**112**		Pediatric wards	19	17.0
21-25 yrs old	24	21.4	General wards	12	10.7
26-30 yrs old	45	40.2	ER/ICU	6	5.4
31-35 yrs old	7	6.3			
36-40 yrs old	12	10.7	**Career development toward**	**111**	
41-45 yrs old	13	11.6	**nursing administrators**		
46-50 yrs old	6	5.4	No	103	92.0
Above50 yrs old	5	4.4	Yes, why?	8	7.1
			Normal life	5	62.5
Length of work	**112**	Mean	Learning	2	25.0
experience (years)		8.74			
1 - 2	20	17.9	**Career development**	**111**	
3 - 5	35	31.3	**toward NP**		
6- 10	19	17.0	No	101	90.2
11 - 15	4	3.6	Yes, Why?	10	8.9
16- 20	15	13.4	Fixed shifts	4	40.0
Above 20	19	17.0	Challenge	3	30.0
			Goal	1	10.0
Length of current	**112**	Mean			
working (years)		8.49	**Career development**	**111**	
Below 1y	1	0.9	**Change job**		
1 – 2	24	21.4	No	70	62.5
3 - 5	41	36.6	Yes, why?	41	36.6
6- 10	16	14.3	Change direction	9	22.0
11 – 15	6	5.4	Not decide yet	8	19.5
16- 20	9	8.0			
Above 20	15	13.4			

Validity and reliability of two translated scales
Work-Home conflict Scale (WHC)

For content validity, the S-CVI scores was 0.98, indicating a good content validity. In terms of reliability, the Cronbach's α coefficients for this scale was 0.9 indicating a good internal consistency. Besides, both of subscales had good internal consistency. As to the Test-retest reliability, our findings showed that pre-test score was slightly lower than post-test. The overall ICC of this scale was 0.53. For two subscales, the ICC value of the work-family conflict subscale was .47, and the family-work conflict subscale was 0.56, all indicating significant correlations（$p < 0.001$）(Table 2).

The Career Satisfaction Scale (CSS)

Three items CVI values (I-CVIs) were 0.80, two items CVI values were 1.00, overall scale CVI value (S-CVI) was 0.84 indicating a good content validity. For internal consistency, the Cronbach's alpha value was 0.92 indicating a good internal consistency. The results of test-retest reliability, the ICC value of the scale was 0.63（$p < 0.001$）showing a quiet stability between two tests (Pre-test and post-test) (Table 2) .

Table 2. *Validity and reliability of two translated scales*

Scale and subscales	No.of item	CVI	Cronbach's α	Test-retest reliability				ICC	P-value
				Pre-test		Post-test			
				Mean	SD	Mean	SD		
Work-Home Conflict Scale (WHC)	10	0.98	0.90	28.39	6.77	29.05	6.36	0.53	.000[***]
Work-Home Conflict	5		0.90	16.14	3.83	16.03	3.90	0.47	.000[***]
Home- Work Conflict	5		0.89	12.25	3.99	13.02	3.73	0.56	.000[***]
The Career Satisfaction Scale (CSS)	5	0.84	0.92	17.74	3.19	17.94	2.92	0.63	.000[***]

[***] $P < .001$

Psychometric test of two self-developed instruments
The Scale of Support and Barrier in Work (SSBW)
Content validity

The original initial questionnaire was a 13-item scale. The S-CVI value of all items was 1.00. However, according to experts' opinions, we added two items: "institutional reputation" and "salary and benefits". Thus, a total number of 15 questions in this scale (Table 3).

Item analysis

Firstly, we checked item-to-item correlation. If the r coefficient >0.9 between two items, we deleted one of them to avoid the overlap between the two items. In this scale, all r coefficients were <0.9. As to homogeneity test, all items revealed a significant relationship with total score (P<.001) indicating a good homogeneity. For the extreme group comparison, a good discriminant validity analysis was found between two extreme groups in each item and total scale (P<.0001).

Construct validity

EFA. For the SSBW, the results of Bartlett's test of sphericity (χ^2 = 1414.53, $p < .0001$) and Kaiser–Meyer–Olkin (KMO = 0.85) indicated a satisfactory candidate for factor analysis. Inspection of eigenvalues >1 and scree plots of EFAs indicated two three factors, which were positive and negative outcome expectations. The factor loading of each corresponding item was between 0.49 and 0.91, indicating each item to be homogeneous with the factor (Table 4). Percentage variances in three factors were 49.2% and 16.2%, and 7.1%, respectively; the three factors explained 72.4% of the total variance, indicating that three factors explained large amounts of variance (Table 4).

Reliability

In terms of reliability, the Cronbach's α coefficients for this scale was 0.92 indicating a good internal consistency. As to the test-retest reliability, the ICC of this scale was 0.52. indicating a significant correlations（$p < 0.001$）with a moderate stability (Table 3).

Table 3. *Validity and reliability of two self- development scales*

Scale and subscales	No.of item	CVI	Cronbach's α	Test-retest reliability				ICC	P-value
				Pre-test		Post-test			
				Mean	SD	Mean	SD		
The Scale of Support and Barrier in Work (SSBW)	15	1.00	0.92	56.84	6.22	55.31	7.68	0.52	.000***
The Scale of Nursing Competence (SNC)	60	0.99	0.98	242.8	30.96	239.5	29.13	0.63	.000***
Clinical Care	10		0.92	41.69	4.91	41.11	4.73	0.69	.000***
Legal/ethical	12		0.94	50.75	6.30	49.48	6.32	0.43	.002**
Communication and coordination/collaboration	9		0.96	38.31	4.77	37.05	4.79	0.51	.000***
Leadership and management	11		0.95	46.12	7.93	45.84	7.51	0.67	.000***
Teaching and Coaching	8		0.89	31.39	5.03	31.04	4.75	0.63	.000***
Professional development	10		0.95	34.55	8.05	35.13	6.56	0.56	.000***

** $P<.01.$ *** $P<.001$

Table 4.*Matrix Summary of Exploratory Factor Analysis (After Rotation) (N = 112)*

	Item	Factor1	Factor2	Factor3	Explained Variance (%)
Factor1					49.2
	CE15	.89			
	CE14	.89			
	CE13	.85			
	CE12	.84			
	CE10	.78			
	CE8	.76			
	CE11	.73			
	CE9	.66			
	CE7	.51			
Factor2					16.2
	CE3		.91		
	CE4		.91		
	CE5		.87		
Factor3					7.1
	CE1			.86	
	CE2			.84	
	CE6			.49	
Total explained variance					72.4

The Scale of Nursing Competence (SNC)

Content validity

The original initial questionnaire was a 66-item scale. The S-CVI value of all items was 0.99. However, according to experts' opinions, we added two items. Thus, a total number of 68 questions in this scale.

Item analysis

Firstly, we checked item-to-item correlations. If the r coefficient >0.9 between any two items, we deleted one of them to avoid the overlap between the two items. In this step, 8 questions were deleted. The final scale included 60 items into six major domains: clinical care (10 items); legal/ethical practice (12 items); communication and coordination/collaboration (9 items); leadership and management (11 items); teaching and coaching (8 items); professional development (10 items). In the 60-item scale, all r coefficients were <0.9 and with good homogeneity, all items revealed a significant relationship with total score ($P<.001$). For the extreme group comparison, a good discriminant validity analysis was found between two extreme groups in each item and total scale ($P<.0001$).

Construct validity

EFA. For the SSBW, the results of Bartlett's test of sphericity ($\chi^2 = 8526.04$, $p < .0001$) and Kaiser–Meyer–Olkin (KMO = 0.88) indicated a satisfactory candidate for factor analysis. Inspection of eigenvalues >1 and scree plots of EFAs indicated nine factors, which were positive and negative outcome expectations. The factor loading of each corresponding item was between 0.40 and 0.91, indicating each item to be homogeneous with the factor. Percentage variances in first two factors were 47.8% and 10.8%, respectively; the nine factors explained 78.9% of the total variance, indicating that nine factors explained large amounts of variance (Table 5). Among the nine factors, four factors could be combined into two factors (factor 5 and factor 7, factor 2 and factor 6). The new seven factors were similar with our classification (six domains). However, there were still a few items could not merge or named. Therefore, we adopted our classification because the scale was developed by literature and theoretical base. Six domains of the final scale were reserved.

Reliability

In terms of reliability, the Cronbach's α coefficient for this scale was 0.98 indicating a relatively high internal consistency. Six subscales also revealed good internal consistency. As to the test-retest reliability, our findings showed that pre-test score was slightly higher than post-test. The ICC of this scale was 0.63. For six subscales, the ICC values ranged from 0.43 (legal/ethical practice) to 0.69 (critical care) indicating significant correlations between pre-test and post-tests（$p < 0.01$）with a moderate stability (Table 3).

Table 5.*Matrix Summary of Exploratory Factor Analysis (After Rotation) (N = 112)*

Item	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5	Factor 6	Factor 7	Factor 8	Factor 9	Explained variance (%)
Factor1										47.8
PD63	.91									
PD64	.88									
PD62	.88									
PD65	.85									
PD67	.83									
PD68	.82									
PD66	.69									
Factor2										10.8
LE25		.87								
LE23		.85								
LE24		.85								
LE21		.84								
LE20		.81								
LE22		.71								
COM33		.56								
COM26		.55								
LE19		.50								
Factor3										4.5
LM46			.77							
LM47			.74							
LM43			.71							
LM45			.70							
LM48			.67							
LM38			.65							
LM36			.63							
LM37			.63							
LM42			.61							
LM44			.56							
LM40			.52							
LE13			.51							
CC5			.47							
Factor4										3.9
COM31				.79						
COM30				.77						
COM29				.75						
COM28				.66						
COM34				.63						
COM35				.62						
COM32				.59						
TC49				.45						

Table 5.*Matrix Summary of Exploratory Factor Analysis (After Rotation) (N = 112) (cont.)*

Item	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5	Factor 6	Factor 7	Factor 8	Factor 9	Explained variance (%)
Factor5										3.0
CC2					.82					
CC1					.81					
CC3					.76					
CC7					.62					
CC9					.54					
CC10					.51					
Factor6										2.7
LE16						.65				
LE14						.64				
LE17						.63				
LE15						.60				
TC52						.46				
Factor7										2.4
CC12							.76			
CC11							.70			
CC8							.68			
Factor8										2.0
PD60								.63		
PD59								.50		
PD61								.47		
TC50								.44		
TC58								.42		
TC56								.40		
Factor9										1.7
TC55									.72	
TC54									.69	
TC53									.64	
Total explained variance										**78.9**

Conclusions

A total of four scales including two translated scales and two self-development scales were tested and validated in this study. For two translated scales: "Work-Home conflict scale" and "The Career Satisfaction Scale" (CSS) all showed good content validity, internal consistency, and a moderate stability. For two self-developed instruments, "The Scale of Support and Barriers in Work" (SSBW) not only showed good content validity and discriminant validity but also construct validity. The results of the EFA provided support for a three factors structure for the SSBW (a 15-item scale). The three-factor structure was found to explain 72.4% of the total variance. As to reliability, a high internal consistency and a moderate stability were also identified. With regard to the Scale of Nursing Competence (SNC), based on content validity, item analysis, and construct validity tests, a final questionnaire was identified with a total of 60-item scale. This scale revealed a relatively good content validity. Besides, the findings for the EFA indicated high construct validity. The nine-factor structure accounted for 78.9% of the total variance. In terms of reliability, SNC also indicated a good internal consistency and a moderate stability. In summary, the results of this study suggest that these scales have demonstrated evidence of internal consistency reliability, content validity and divergent validity. Based on our findings, the four instruments will be appropriately used in future study to examine and to compare the career development and trajectory, as well as the changes of intention to stay for both genders.

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106年度專題研究計畫成果彙整表

計畫主持人：于漱				計畫編號：106-2629-B-010-002-		

計畫名稱：不同性別護理師之職涯發展軌跡與留任意願研究：整體性、縱貫性的觀點

成果項目				量化	單位	質化 （說明：各成果項目請附佐證資料或細項說明，如期刊名稱、年份、卷期、起訖頁數、證號...等）
國內	學術性論文	期刊論文		0	篇	
		研討會論文		0		
		專書		0	本	
		專書論文		0	章	
		技術報告		0	篇	
		其他		0	篇	
	智慧財產權及成果	專利權	發明專利	申請中	0	件	
				已獲得	0		
			新型/設計專利	0		
		商標權		0		
		營業秘密		0		
		積體電路電路布局權		0		
		著作權		0		
		品種權		0		
		其他		0		
	技術移轉	件數		0	件	
		收入		0	千元	
國外	學術性論文	期刊論文		0	篇	
		研討會論文		0		
		專書		0	本	
		專書論文		0	章	
		技術報告		0	篇	
		其他		1	篇	預計發表國際知名學術期刊論文一篇，目前在整理中。
	智慧財產權及成果	專利權	發明專利	申請中	0	件	
				已獲得	0		
			新型/設計專利	0		
		商標權		0		
		營業秘密		0		
		積體電路電路布局權		0		
		著作權		0		
		品種權		0		

		其他	0		
	技術移轉	件數	0	件	
		收入	0	千元	
參與計畫人力	本國籍	大專生	0	人次	
		碩士生	0		
		博士生	1		博士班研究生- 兼任研究助理：莊菁昀
		博士後研究員	1		博士後研究- 戴宏達（具部定助理教授證書；其資格符合共同主持人；原列共同主持人；然不知何故未顯現於共同主持人名單中；故現暫改列博士後研究員）
		專任助理	0		
	非本國籍	大專生	0		
		碩士生	0		
		博士生	0		
		博士後研究員	0		
		專任助理	0		
其他成果 （無法以量化表達之成果如辦理學術活動、獲得獎項、重要國際合作、研究成果國際影響力及其他協助產業技術發展之具體效益事項等，請以文字敘述填列。）					

科技部補助專題研究計畫成果自評表

請就研究內容與原計畫相符程度、達成預期目標情況、研究成果之學術或應用價值（簡要敘述成果所代表之意義、價值、影響或進一步發展之可能性）、是否適合在學術期刊發表或申請專利、主要發現（簡要敘述成果是否具有政策應用參考價值及具影響公共利益之重大發現）或其他有關價值等，作一綜合評估。

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1. 請就研究內容與原計畫相符程度、達成預期目標情況作一綜合評估
   ■達成目標
   □未達成目標（請說明，以100字為限）
       □實驗失敗
       □因故實驗中斷
       □其他原因
   說明：

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2. 研究成果在學術期刊發表或申請專利等情形（請於其他欄註明專利及技轉之證號、合約、申請及洽談等詳細資訊）
   論文：□已發表　□未發表之文稿　■撰寫中　□無
   專利：□已獲得　□申請中　■無
   技轉：□已技轉　□洽談中　■無
   其他：（以200字為限）

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3. 請依學術成就、技術創新、社會影響等方面，評估研究成果之學術或應用價值（簡要敘述成果所代表之意義、價值、影響或進一步發展之可能性，以500字為限）

   護理人力的留任與形象的轉型（由"女性的職業"轉變為"兩性的職業"）一直是護理國際社會的重要議題。本研究是原計畫系列中之第一部份，研究主題為：「護理職涯量表」的發展與測試（執行期限為 2017/8/1- 2018/7/31）。綜合本研究之成果為：1.完成了兩份測量工具之翻譯與測試（「工作－家庭衝突量表」與「職業發展滿意度量表」）；2.完成了兩份自擬問卷之發展與測試（「職業發展的助力及阻力因素問卷」與「護理能力量表」）。上述工具將用於後續之研究，以期展開後續之不同性別護理師之職涯發展軌跡與留任意願研究：橫斷式與縱貫性研究。待以上研究結果均完成後，將能提供我國瞭解不同性別護理師之職業選擇及進入職場後第一個五年內的職涯發展軌跡與留任意願變化；以及能進而探究兩性之間是否存在差異？差異為何？而影響因素分析則將有助於發展有效介入方案參考，以更有效促進其護理職涯發展、增加留任意願，進而對對提高護理專業形象及護理人力資源有實質貢獻，且亦能增加對此方面議題之認識，及有助於知識體系建構。

4. 主要發現

本研究具有政策應用參考價值：□否　■是，建議提供機關衛生福利部,
（勾選「是」者，請列舉建議可提供施政參考之業務主管機關）

本研究具影響公共利益之重大發現：■否　□是

說明：（以150字為限）